Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (previously presented). An electronic imaging system for capturing an image of a scene; said imaging system comprising:

(a) an optical system producing an optical image of the scene;

(b) an imaging sensor having a surface in optical communication with the optical system; and

(c) a plurality of imaging elements distributed on the surface of the imaging sensor, said imaging elements converting the optical image into a corresponding output image, said imaging elements being located according to a distribution representable by a nonlinear function in which the relative density of the distributed imaging elements is greater toward the center of the sensor, wherein the distribution provides physical coordinates for each of the imaging elements corresponding to a projection of the scene onto a non-planar surface, wherein said output image has a plurality of pixels, each said pixel corresponding to a respective one of said imaging elements;

wherein said optical system provides a perspective projection of said optical image onto said surface, said optical image has a perspective distortion relative to said surface, said perspective distortion being inherent in geometry of said perspective projection onto said surface, and said distribution of said imaging elements on said surface of said imaging sensor compensates said output image for said perspective distortion, such that said output image is free of said perspective distortion and has said pixels in a uniform rectilinear array.

2 (original). The system of claim 1 wherein the non-planar surface is a cylinder.

3 (original). The system of claim 1 wherein the non-planar surface is a sphere.

4 (original). The system of claim 2 wherein the optical system includes a lens and the axis of rotation of the cylinder intersects a nodal point of the lens.

5 (original). The system of claim 3 wherein the optical system includes a lens and the center of the sphere is located at a nodal point of the lens.

6 (original). The system of claim 2 wherein the radius of the cylinder is a function of a focal length of the optical system.

7 (original). The system of claim 3 wherein the radius of the sphere is a function of a focal length of the optical system.

8 (original). The system of claim 1 wherein the imaging sensor is a charge-coupled device.

9 (original). The system of claim 1 wherein the imaging sensor is a CMOS device.

10 (original). The system of claim 1 wherein the output signal includes data from a plurality of images.

11 (original). The system of claim 10 further including a processor for combining the images into a composite image, whereby the processor can operate directly on the output signal without having to warp the image data.

12 (original). The system of claim 11 further including a projector for projecting the composite image onto a planar surface.

13-22 (cancelled).

23 (previously presented). A method of generating a composite digital image from at least two source optical images, said method comprising:

providing a perspective projection of each of said source optical images onto a planar surface of an image sensor, wherein each of said source optical images has a perspective distortion relative to said surface, said perspective distortion being inherent in geometry of said perspective projection onto said surface, said image sensor having a plurality of imaging elements, said imaging elements having a distribution on said surface compensatory for said perspective distortion;

generating at least two source digital images corresponding to said optical images, said source digital images each having a plurality of pixels, each said pixel corresponding to a respective one of said imaging elements, said pixels being in a uniform rectilinear array free of said distortion; and

combining the source digital images without further correction of said perspective distortion to form a composite digital image.

24 (currently amended). The method of claim 23 further comprising the step ~~(c)~~ of projecting the composite digital image.

25 (original). The method of claim 23 wherein the two source digital images overlap in overlapping pixel regions.

26 (previously presented). The method of claim 23 wherein said perspective distortion corresponds to a projection of the scene onto a cylinder.

27 (previously presented). The method of claim 23 wherein said perspective distortion corresponds to a projection of the scene onto a sphere.

28 (previously presented). A method of generating a composite digital image, said method comprising:

projecting an optical image of a scene on an image sensor having a planar surface, said optical image having a perspective distortion relative to said planar surface, said perspective distortion being inherent in geometry of said projecting on said planar surface, said image sensor having a plurality of imaging elements, said imaging elements being located according to a non-linear distribution representable by a projection of the scene onto a non-planar surface;

generating a digital image corresponding to said optical image using said image sensor said digital image having a plurality of pixels, each said pixel corresponding to a respective one of said imaging elements, said pixels being in a uniform rectilinear array free of said perspective distortion.

29 (previously presented). The method of claim 28 wherein said imaging elements are linearly addressed.

30 (previously presented). An electronic imaging system comprising:

an optical system transmitting an optical image; and

a plurality of imaging elements having a distribution defining a plane, said imaging elements receiving said optical image as a perspective projection onto said plane, said imaging elements and converting said optical image into a corresponding output image, said distribution representing a nonlinear function corresponding to a projection of the scene onto a non-planar surface, said output image having a plurality of pixels, each said pixel corresponding to a respective one of said imaging elements;

wherein said optical image has a perspective distortion relative to said plane, said perspective distortion being inherent in geometry of said perspective projection onto said plane, and said distribution of said imaging elements on said plane compensates for said perspective distortion, such that said output image is free of said perspective distortion and has said pixels in a uniform rectilinear array.

31 (previously presented). The system of claim 30 wherein said imaging elements are linearly addressed.

32 (previously presented). The system of claim 30 further including a processor combining said output signal and one or more additional output signals into a composite image without warping.

33-34 (cancelled).

35 (previously presented). A method of generating a composite digital image, said method comprising:

receiving a perspective projection of a scene onto a plurality of imaging elements defining a plane, said projection having a perspective distortion relative to said plane, said perspective distortion being inherent in geometry of said projection, said imaging elements being located in said plane according to a non-linear distribution representable by a projection of the scene onto a non-planar surface, said distribution being compensatory of said perspective distortion; and

generating a digital image corresponding to said optical image using said imaging elements without further correction of said perspective distortion, said digital image having a plurality of pixels, each said pixel corresponding to a respective one of said imaging elements, said pixels being in a uniform rectilinear array free of said perspective distortion.

36 (previously presented). The method of claim 35 further including combining said digital image and one or more additional digital images into a composite image without warping.